UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,666	03/17/2004	Mark Rodighiero	52202/JEJ/U56	2687

23363 7590 07/12/2007
CHRISTIE, PARKER & HALE, LLP
PO BOX 7068
PASADENA, CA 91109-7068

EXAMINER	
AKANBI, ISIAKA O	
ART UNIT	PAPER NUMBER
2886	
MAIL DATE	DELIVERY MODE
07/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/802,666	RODIGHIERO ET AL.	
	Examiner	Art Unit	
	Isiaka O. Akanbi	2886	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 April 2007*.

2a)☒ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Amendment

The amendment filed on 27 April 2007 has been entered into this application.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 20-29 are rejected under 35 U.S.C. 102(e) as being anticipated by Jang et al. (6,608,959 B2).

As to claim 20, Jang discloses a system for performing a force bend alignment to re-align optical components of a photonic package after permanent fixation, comprising a stage (102) capable of providing movements and exerting force in at least one direction (i.e. x or y) and a gripper (106) suitable for grabbing an optical component of the photonic package, wherein the gripper is adapted to perform a sweep of force vectors on at least one of the optical components of the photonic package in an automated manner to determine direction to plastically deform (col. 6, line 64-col. 7, line 1-4) a supporting member coupled to said at least one of the optical components to re-align the optical components (col. 1, line 54-65)(col. 4, line 19-31)(col. 6, line 36-45).

As to claim 21, Jang discloses a control feedback loop for providing a force feedback signal and for adjusting the applied force vector using the force feedback signal (230) by the process of (fig. 5b)(col. 5, line 34-col. 6, line 1-21).

As to claims 22-23, Jang discloses force feedback signal that is used to zero out forces exerted by the gripper upon grabbing the optical component to perform the sweep of force vectors (fig. 5b)(col. 6, line 35-47) and control feedback loop provides an actual position signal, which is used to control initial alignment of the optical components (figs. 5a-b)(col. 4, line 51-67).

As to claim 24, Jang discloses wherein said at least one of the optical components is plastically deformed so as to realize the re-alignment (col. 6, line 67-col. 7, line 1-4).

As to claim 25, Jang discloses a ferrule (48), and the supporting member comprising a clip (52) attached to the ferrule, and wherein the clip is plastically deformed by grabbing the ferrule with a gripper (106) and exerting force on it through moving at least one of the stage and the gripper (figs. 2,4, 6, 8, 9 and 11)(col. 4, line 44-50)(col. 6, line 67-col. 7, line 1-4).

As to claims 26 and 27, Jang discloses a laser (30) or photodetector (110), wherein the re-alignment is between the ferrule (48) and said laser or photodetector and wherein a direction to deform the clip is determined through measuring an optical signal after applying each force vector during the sweep (fig. 6)(fig. 8)(fig. 9)(fig. 11)(col. 4, line 61-col. 5, line 1-14)(col. 6, line 22- col. 7, line 1-4).

As to claim 28, Jang discloses a linear sweep force vectors to confirm the determined direction by gripper moving the ferrule +Y direction (fig. 5a)(col. 5, line 4-6).

As to claim 29, Jang discloses wherein the gripper (106) grabs the clip softly or loosely, whereby the gripper does not exert torsion forces (col. 4, line 27-28 and line 44-45)(fig. 6)(col. 7, line 2-4).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-19, 30-32 and 35-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jang et al. (6,608,959 B2) in view of Miyokawa et al. (2002/0001324 A1)

Regarding claim 1, Jang teaches of a method of aligning optical components of photonic package comprising initially aligning the optical components, fixing the optical components with respect to one another through laser welding (col. 1, line 32-38)(col. 2, line 1-10), after fixing (i.e. weld) the optical components, determining a direction (i.e. x/y direction) to plastically deform at least one of the optical components (i.e. fiber) through performing a sweep of force vectors (col. 4, line 19-31)(col. 6, line 36-39), and suggested moving the ferrule in the elastic region to permanent deformation (fig. 5a)(col. 5, line 28-40)(col. 5, line 31-34).

Jang discloses in another embodiment (col. 6, line 45-47)(col. 6, line 61-col. 7, line 1-4) applying a force in the determined direction (i.e. x/y) to plastically deform said at least one of the optical components to re-align the optical components.

Additionally it is known in the art to elastically or plastically deforms an optical component (i.e. ferrule) by applying a force in a direction (i.e. x/y/z) to re-align the optical components, as evidenced by Miyokawa (pars. 0014- 0016). Therefore it would have been at least obvious to one having ordinary skill in the art at the time of the invention was made to determined the direction to plastically deform said at least one of the optical components to re-

align the optical components for the purpose of providing accurately shaped ferrule fixing of components.

As to claims 2-3, Jang further discloses providing an actual position signal as a feedback and driving (i.e. moving) at least one motor to align the optical components using the actual position signal (fig. 5b)(col. 5, line 34-40).

As to claim 4, Jang also discloses performing a linear sweep force vectors to confirm the determined direction by gripper moving the ferrule +Y direction (fig. 5a)(col. 5, line 4-6).

As to claims 5-7, Jang further discloses performing the sweep of force vectors comprising elastically deforming of at least one of the optical components using the force vectors, measuring (P3/P2)(224) an optical Signal output associated with each force vector and selecting the direction of a largest optical signal output measured during the sweep (fig.5b)(col. 5, line 28-40)(col. 6, line 12-21).

As to claims 8 -10, Jang also discloses grabbing one of the components, and moving the grabbed one of the components in the determined direction (fig. 8)(fig. 9)(col. 6, line 8-11)(col. 6, line 62-65), gradually increasing the force in the determined direction until a desired force level has been reached and decreasing force to a zero force level (fig. 8)(fig. 9)(col. 6, line 8-21)(col. 6, line 36-47).

As to claim 11, Jang also discloses measuring an optical signal output after the force has been decreased to the zero force level (col. 4, line 61-col. 5, line 1-14).

As to claim 12, Jang further discloses holding the force constant at the desired force level for a predetermined period of time prior to gradually decreasing the force (col. 4, line 63-65).

As to claims 13 and 15, Jang also discloses wherein duration of the constant force is increased if the optical signal output does not have a predetermined strength (fig. 7)(col. 5, line 40-65).

As to claims 14 and 16, Jang further discloses applying the force to plastically deform said at least one of the optical components after increasing the duration of the constant force and after increasing the desired force level in another embodiment, (fig. 11)(col. 6, line 66-col. 7, line 1-4).

As to claim 17, Jang also discloses if too much force has been applied, determining the direction to deform said at least one of the optical components through performing the sweep of force vectors and applying the force plastically deform said at least one of the optical components (col. 7, line 10-20).

As to claim 18, Jang further discloses if the direction cannot be determined, increasing a magnitude of the force vectors and performing the sweep of force vectors (col. 5, line 28-40).

As to claim 19, Jang further discloses performing the sweep of force vectors comprising performing the sweep of force vectors on an X-Y plane (fig. 2)(col. 4, line 63-col. 5, line 1-13).

As to claim 30, Jang teaches of a method of aligning optical components of photonic package of claim 1, comprising aligning optical components (col. 4, line 37-38), b) fixing the optical components with respect to one another through laser welding (col. 4, line 19-21, line 32-33), c) determining a direction (i.e. x or y) to plastically deform one of said optical components through performing a sweep of force vectors (col. 4, line 24-28)(col. 4, line 63-66), d) applying a force having a peak (i.e. 100%)(fig. 7) value in the determined direction (x or y axis) to plastically deform said one of the optical components to re-align the optical components (i.e. ferrule), e) measuring an optical signal after said plastic deformation (P3/P2)(224)(figs. 5 and 7), and f) if a predetermined signal strength is not achieved with the optical signal, repeating c)

through e) with the force in d) having the same peak value or a different peak value (fig. 7)(col. 6, line 12-21).

Jang further discloses in another embodiment (col. 6, line 45-47)(col. 6, line 61-col. 7, line 1-4) applying a force to determined direction (i.e. x or y) to plastically deform said at least one of the optical components to re-align the optical components.

Further it is known in the art to elastically or plastically deformed optical components (i.e. ferrule) to re-align the optical components, as evidenced by Miyokawa (page 1, par. 0014-0016). Therefore it would have been obvious to one having ordinary skill in the art at the time of invention to determined direction to plastically deform said at least one of the optical components to re-align the optical components for the purpose of providing accurate shaped ferrule fixing of components.

As to claim 31, Jang further discloses providing a force feedback signal (230) and controlling (112)(i.e. parameters)(col. 4, line 48-50)(fig. 4) an applied force using the force feedback signal (230) by the process of (fig. 5b)(col. 5, line 34-col. 6, line 1-21).

As to claim 32, Jang further discloses performing the sweep of force vectors in step c) comprises performing the sweep of force vectors on at least an X-Y plane (fig. 4)(fig. 5a-b)(col. 4, line 19-67).

As to claim 35, Jang further discloses the limitation wherein said applying the force comprises determining the force to be applied, and applying the determined force in a controlled manner (col. 5, line 53-54)(col. 6, line 36-47).

As to claim 36, Jang also discloses the limitation wherein the force feedback signal (230)(fig. 5b) is a function of an actual applied force (224) and an estimated applied force, the actual applied force being applied to the optical components and measured by a force transducer, the estimated applied force being determined by measuring current supplied to a

force applying mechanism when applying the force in the determined direction (i.e. x or y)(fig. 4)(col. 4, line 19-30).

As to claims 37-39, Jang further discloses performing the sweep of force vectors comprising elastically deforming of at least one of the optical components using the force vectors, measuring (P3/P2)(224) an optical Signal output associated with each force vector and selecting the direction of a largest optical signal output measured during the sweep (fig.5b)(col. 5, line 28-40)(col. 6, line 12-21).

Claims 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jang et al. (6,608,959 B2).

As to claims 33-34, Jang teaches of gripper (106) use for adjustment (col. 6, line 36-39 and line 61-65).

Jang is silent regarding a pneumatic gripper stop adapted to prevent complete closure of the gripper and adjustment screws that is adapted to be altered to adjust a looseness of the gripper. However it would have been at least obvious to one having ordinary skill in the art at the time of the invention was made to use a pneumatic gripper stop adapted to prevent complete closure of the gripper and adjustment screws that is adapted to be altered to adjust a looseness of the gripper for the purpose of providing accurate alignment.

Response to Arguments

Applicant's arguments/remarks, (see pages 10-15), filed on 27 April 2007, with respect to the rejection(s) of claim(s) 1and 30 under 35 U.S.C. 101 have been fully considered and are persuasive. Therefore, the rejection is withdrawn. However, the rejection(s) of claim(s) 1-34

under 35 U.S.C. 103(a) and 35 U.S.C. 102(e) have been fully considered but they are not persuasive.

In response to Applicant's arguments that cited references Jang and Miyokawa does not provide for determining a direction to plastically deform through performing a sweep of force vectors, it is respectfully pointed out to applicant that this argument is not persuasive as Jang clearly disclose in (col. 4, 44-45 and line 51-60)(col. 4, line 19-31)(col. 6, line 36-39) and shows in (figs. 2, 4, 5a and 8) gripper that perform these limitations.

Further, in response to Applicant's arguments that cited references neither taught nor suggested providing a force feedback signal and controlling an applied force vector using the force feedback signal, it is respectfully pointed out to applicant that this argument is not persuasive as Jang clearly disclose in (col. 5, line 34-40) and shows in (fig. 5b)(230) perform these limitations.

Finally, Applicant agues that cited references do not disclose determining the force to be applied and applying the determined force in a controlled manner. However this argument is not persuasive since Jang clearly disclose in (col. 4, line 48-50) and shown in (figs. 4 and 7) these limitations. As such, the claims are still rejected as shown in the detail above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Isiaka Akanbi whose telephone number is (571) 272-8658. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tarifur R. Chowdhury can be reached on (571) 272-2287. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Isiaka Akanbi

July 7, 2007

TARIFUR CHOWDHURY
SUPERVISORY PATENT EXAMINER